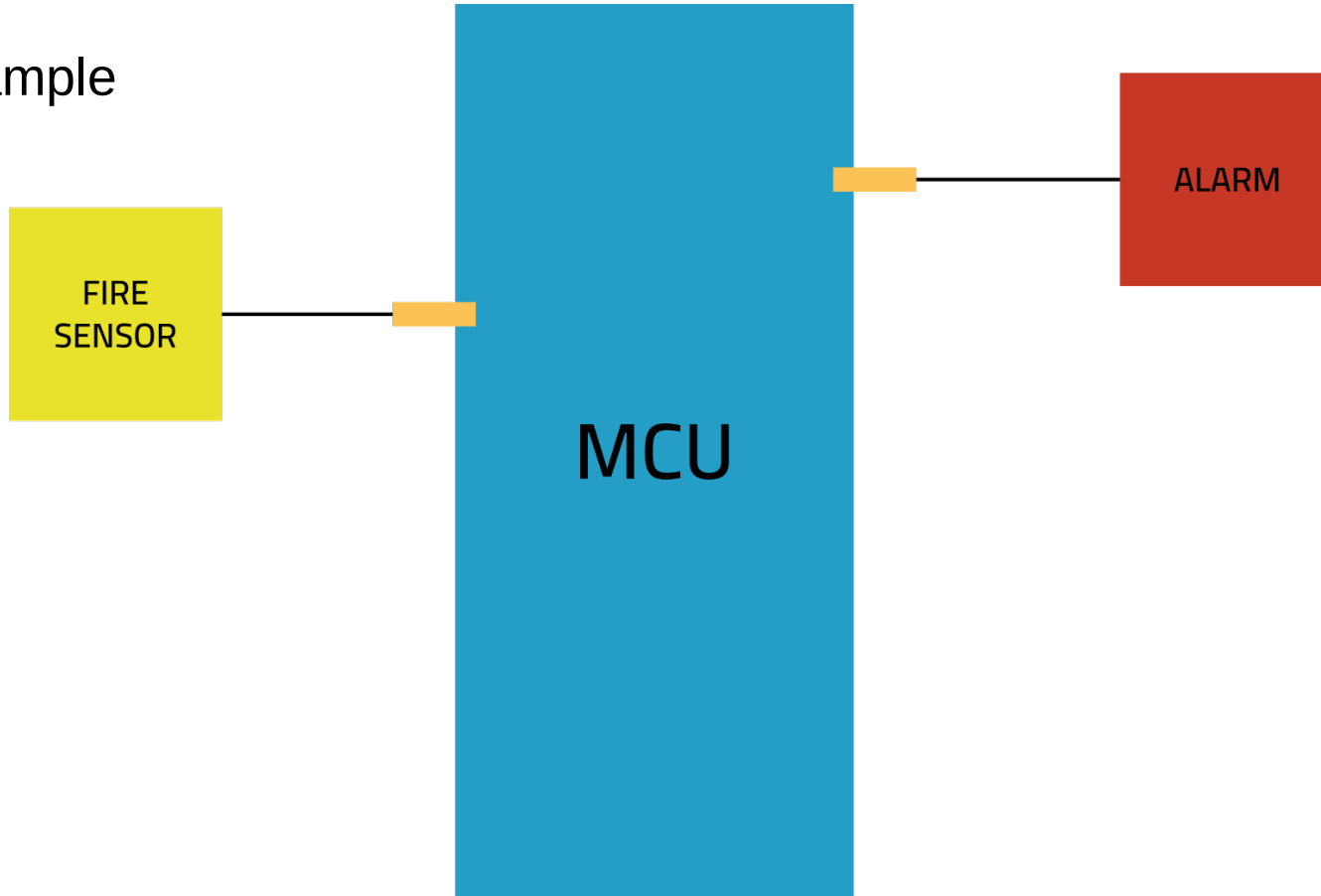


Interrupts

<External Interrupts>

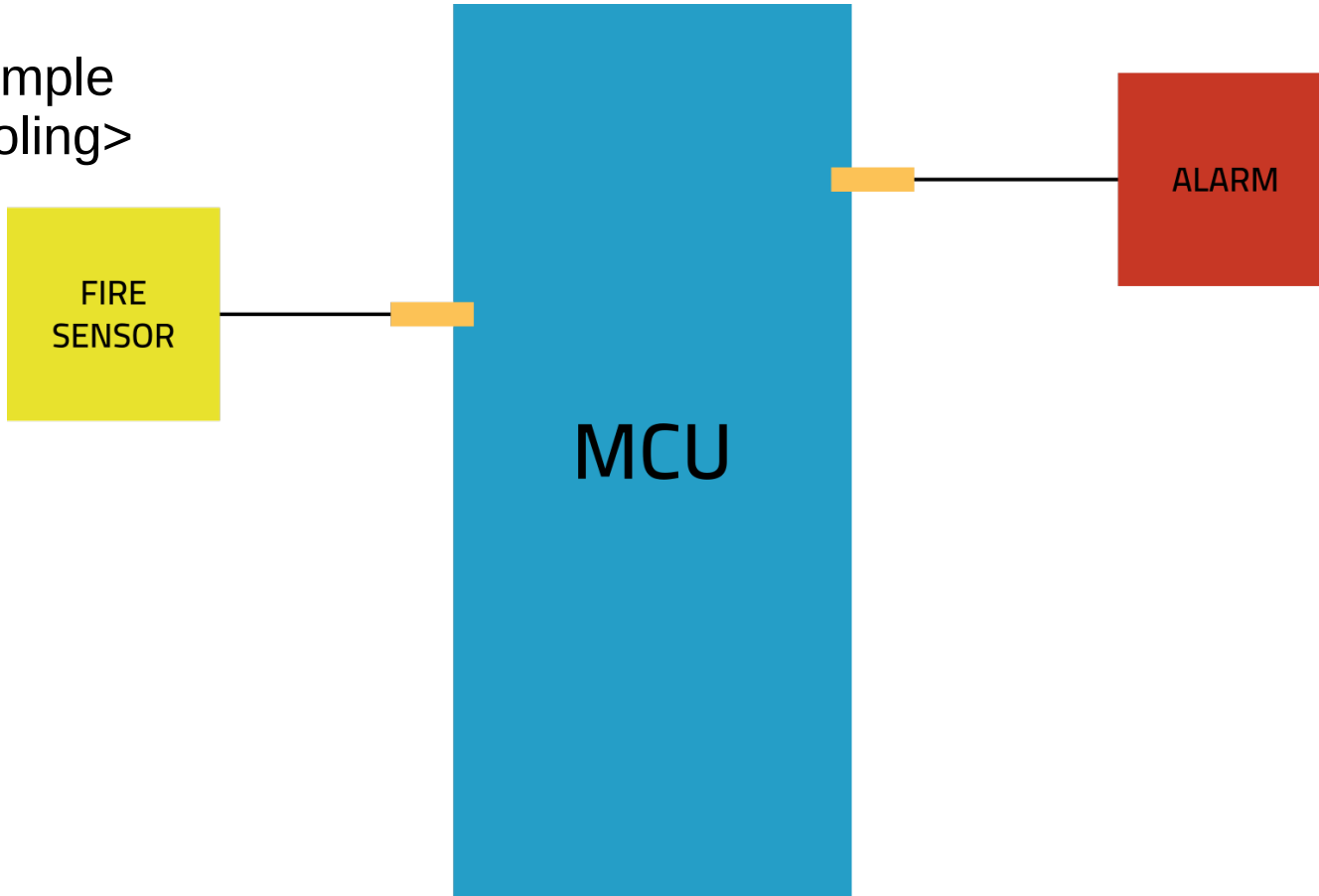
Service Polling vs. Interrupts

Simple Example



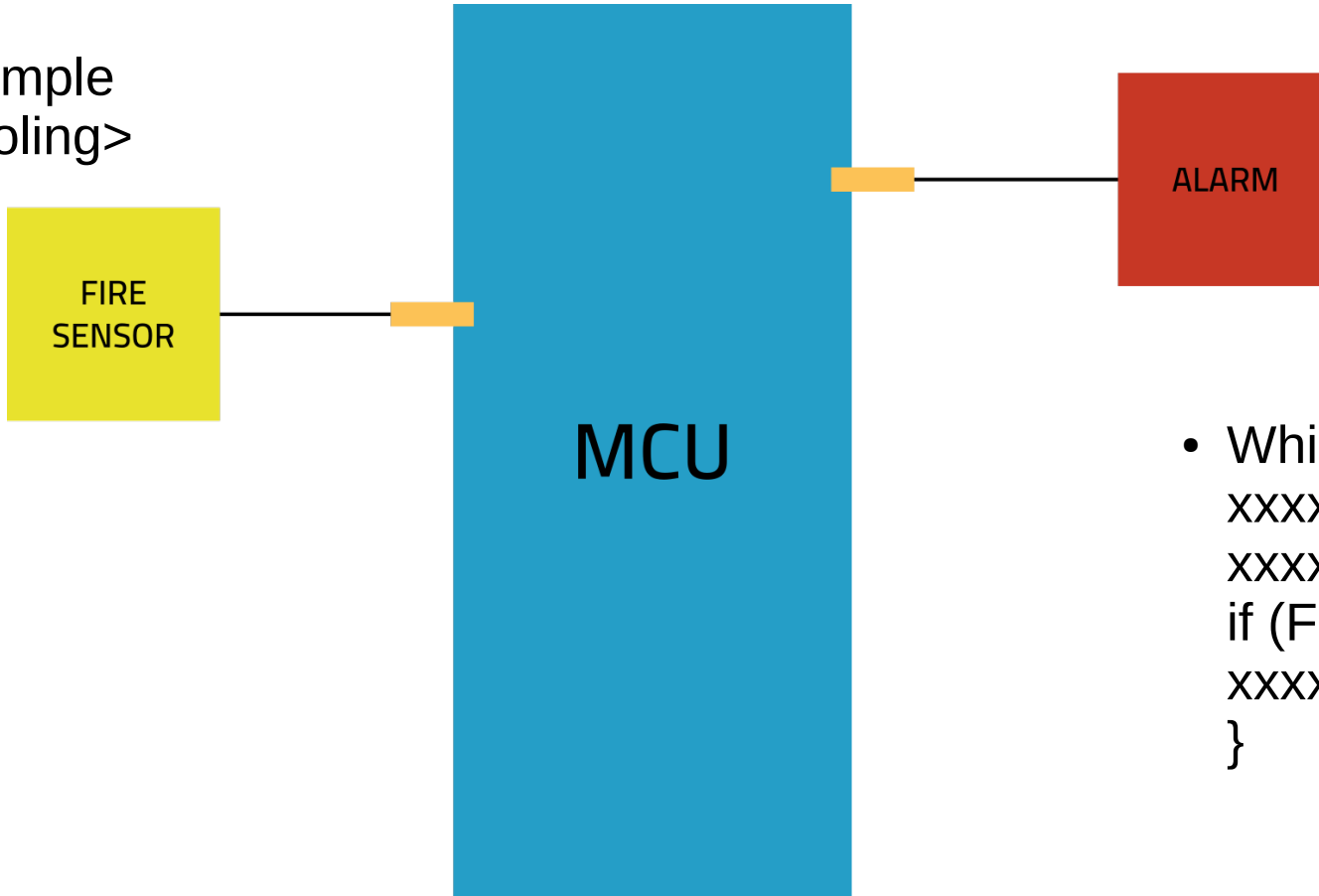
Service Polling vs. Interrupts

Simple Example
<Service Poling>



Service Polling vs. Interrupts

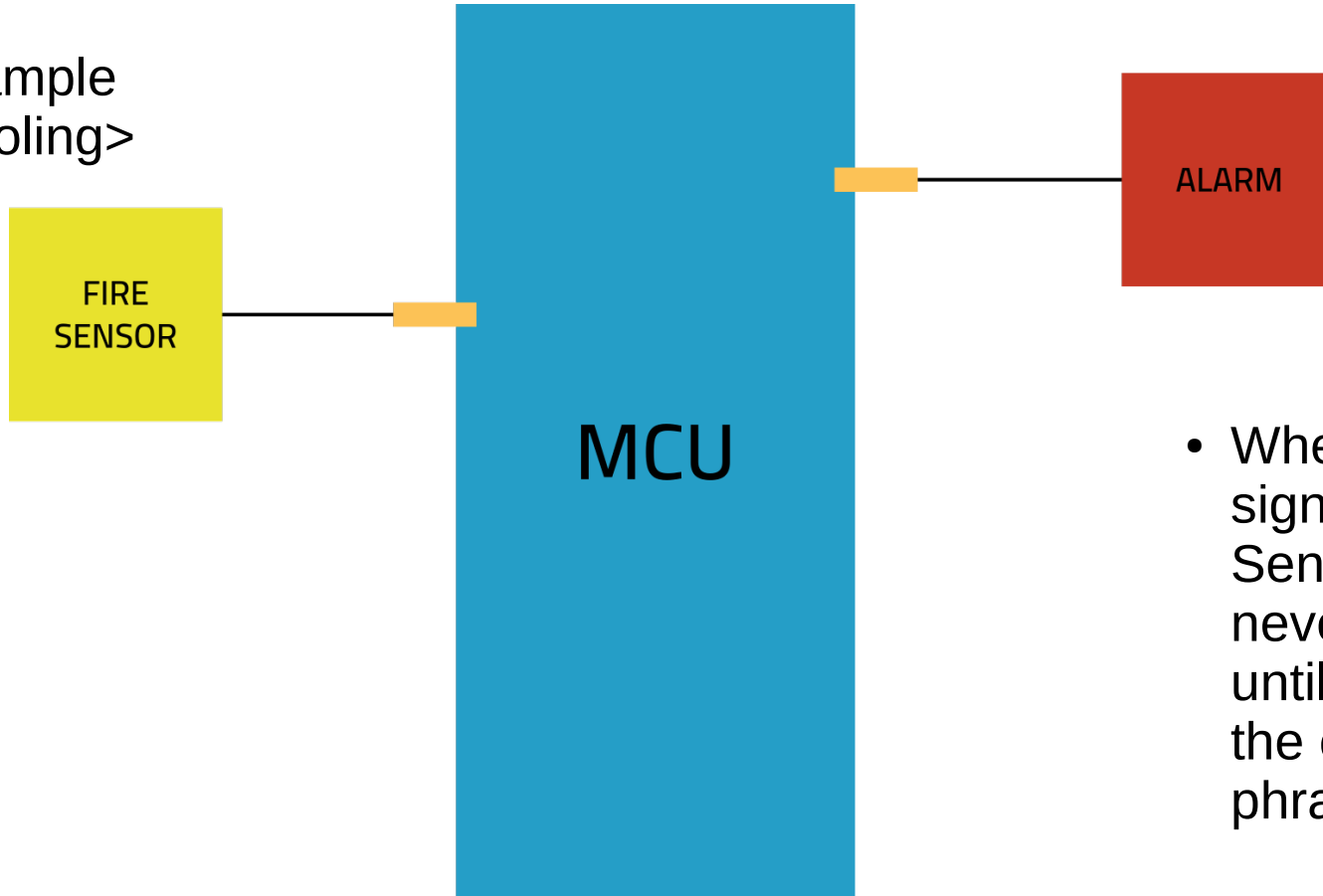
Simple Example
<Service Poling>



- While (1) {
 XXXXXXXXXXXX;
 XXXXXXXXXXXX;
 if (Fire Sensor) {
 XXXXXXXXXXXX; }
}

Service Polling vs. Interrupts

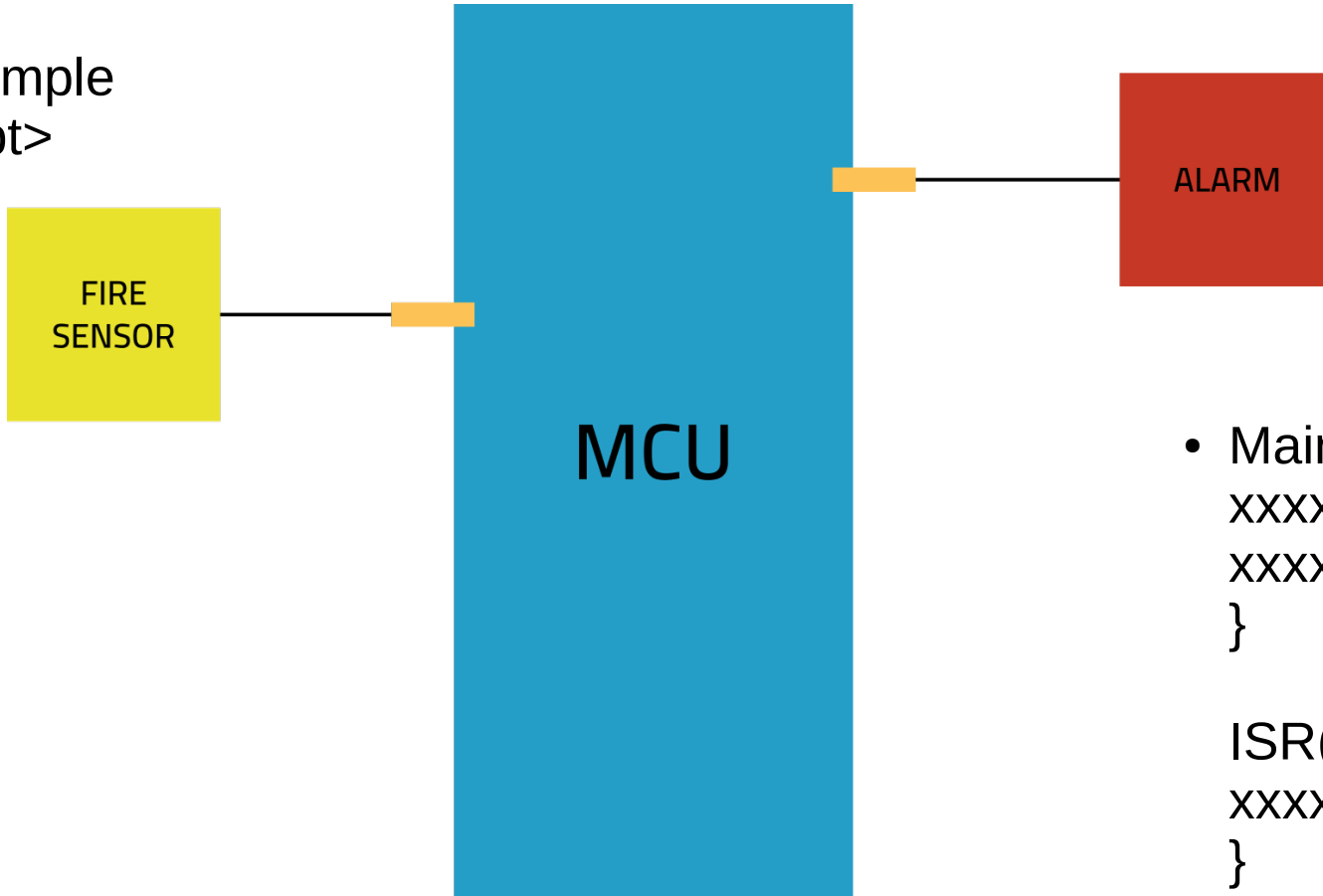
Simple Example
<Service Poling>



- When MCU gets signal from Fire Sensor, MCU never respond until it reaches the condition phrase.

Service Polling vs. Interrupts

Simple Example
<Interrupt>



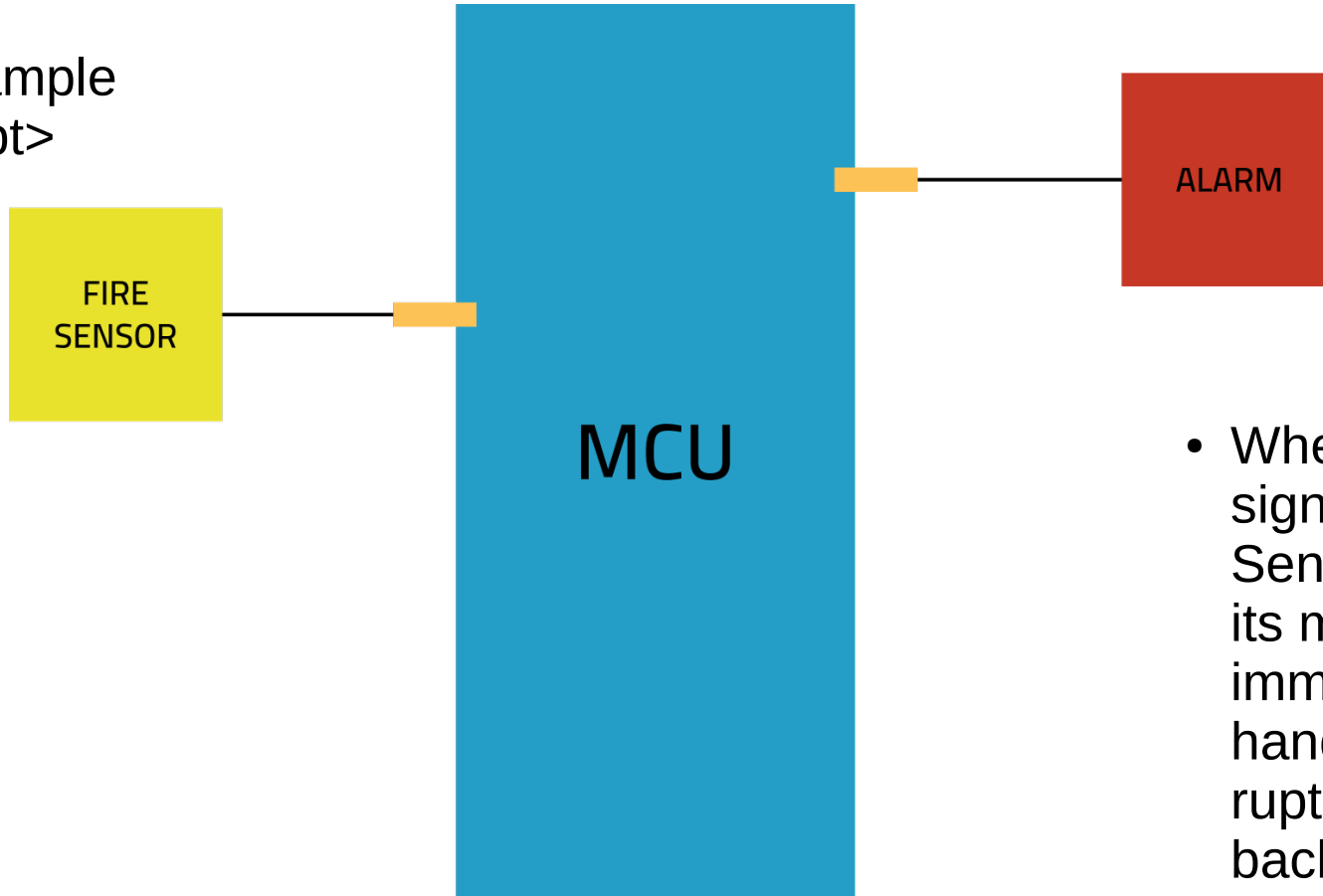
- ```
Main () {
 XXXXXXXXX;
 XXXXXXXXX;
}
```

```
ISR() {
 XXXXXXXXX;
}
```

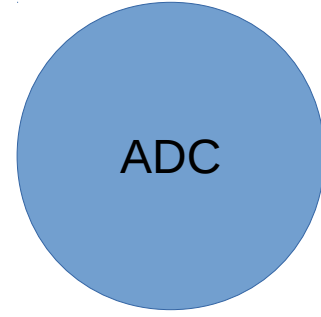
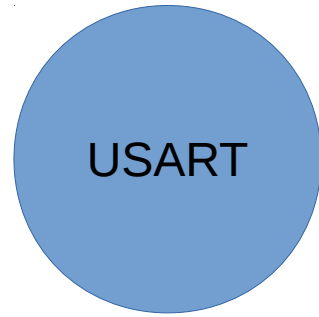
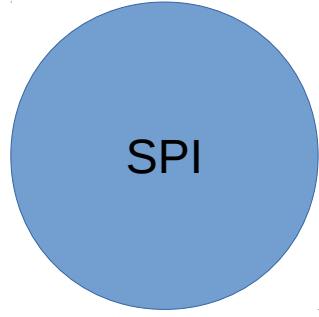
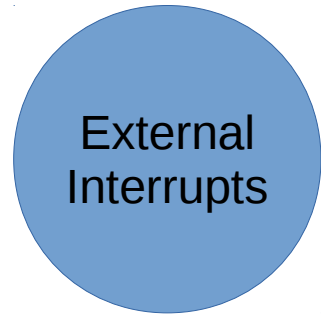
# Service Polling vs. Interrupts

Simple Example  
<Interrupt>



- When MCU gets signal from Fire Sensor, It stops its main operation immediately then, handles the interrupt and returns back when stopped

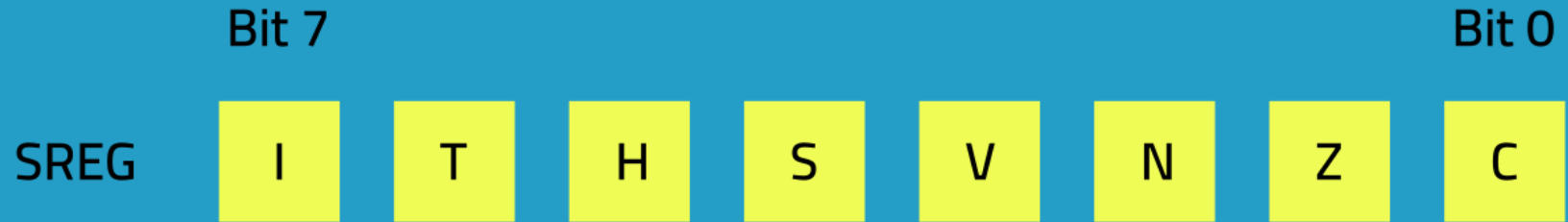
# Interrupt Sources



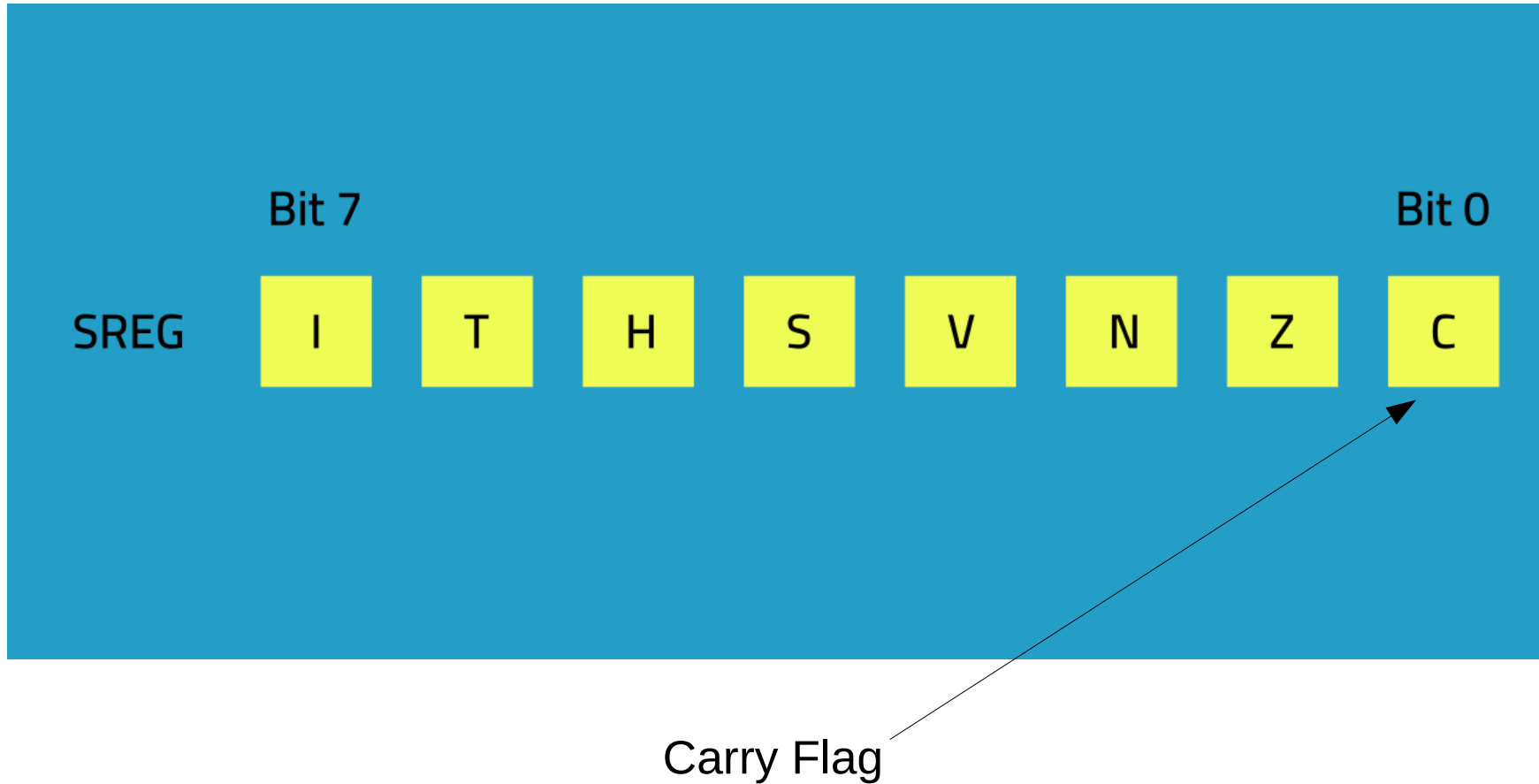
And more ...



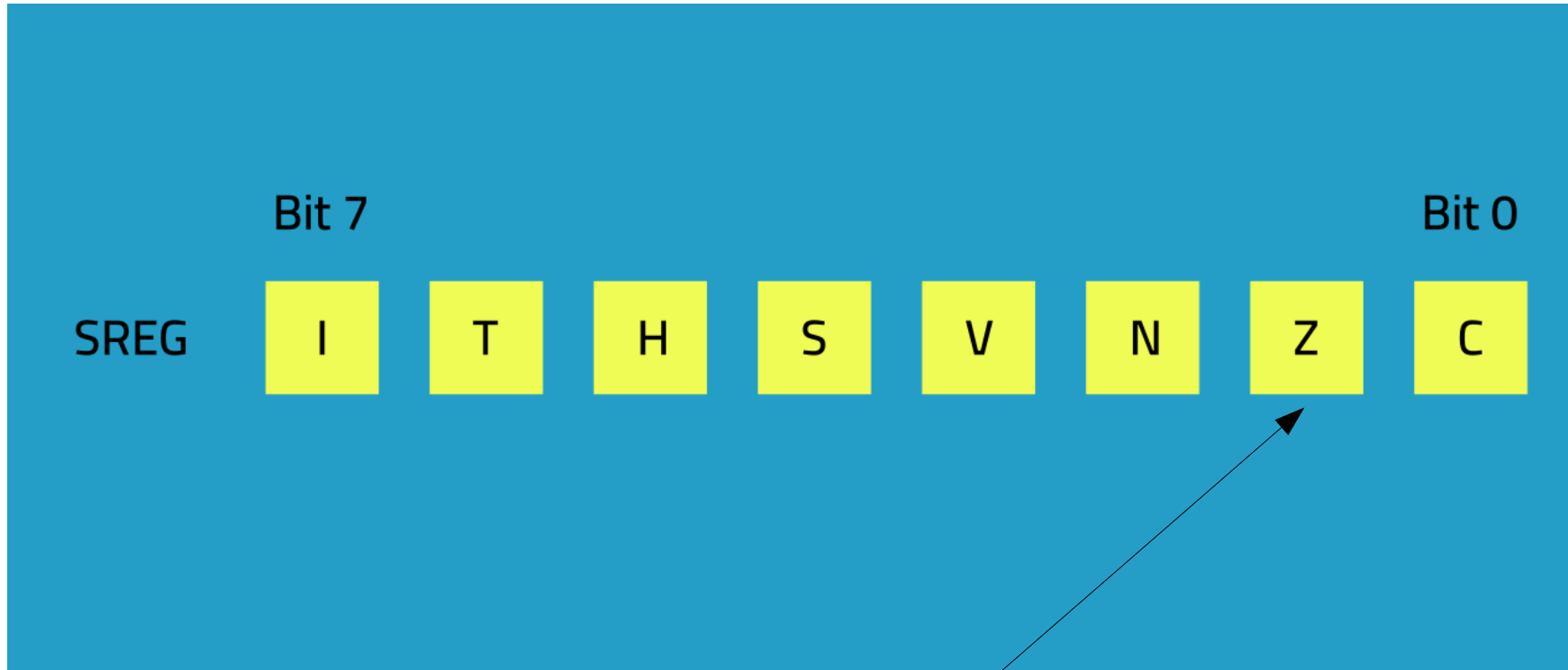
# Status Register



# Status Register

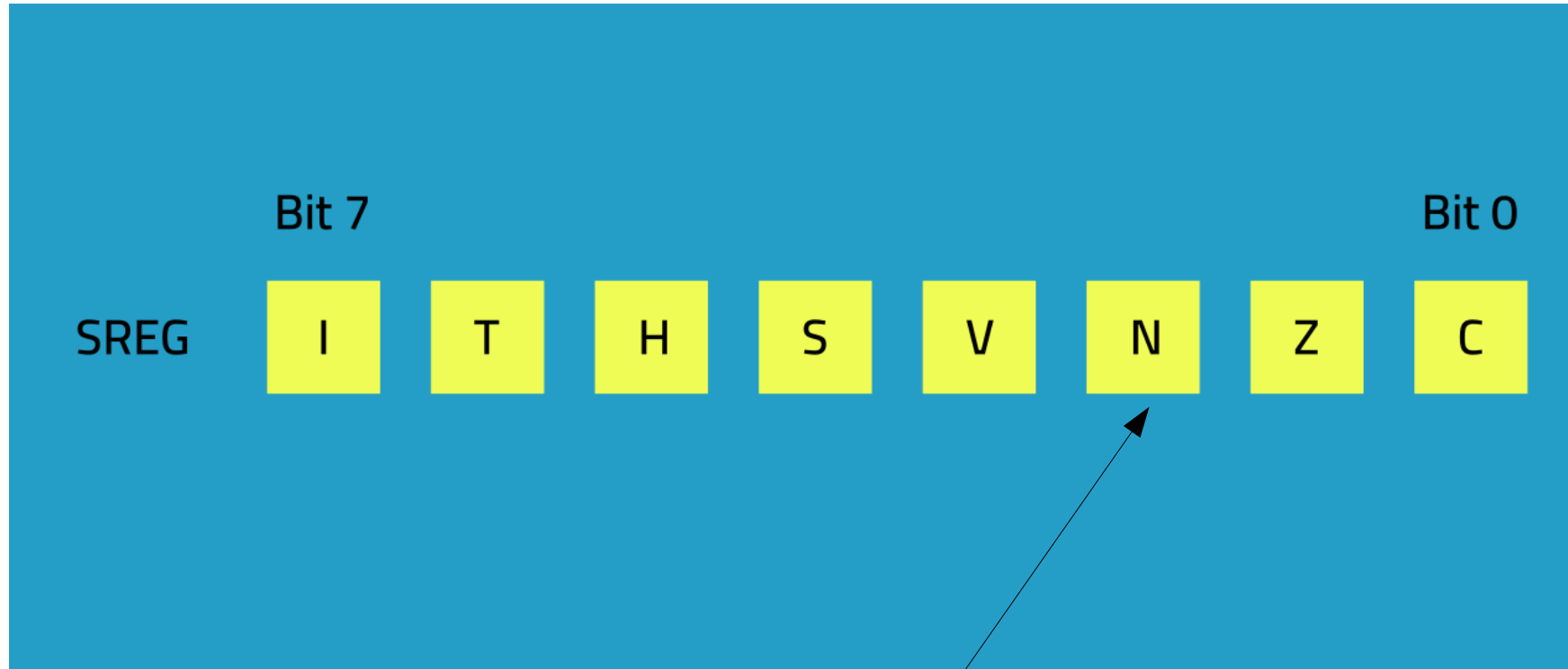


# Status Register



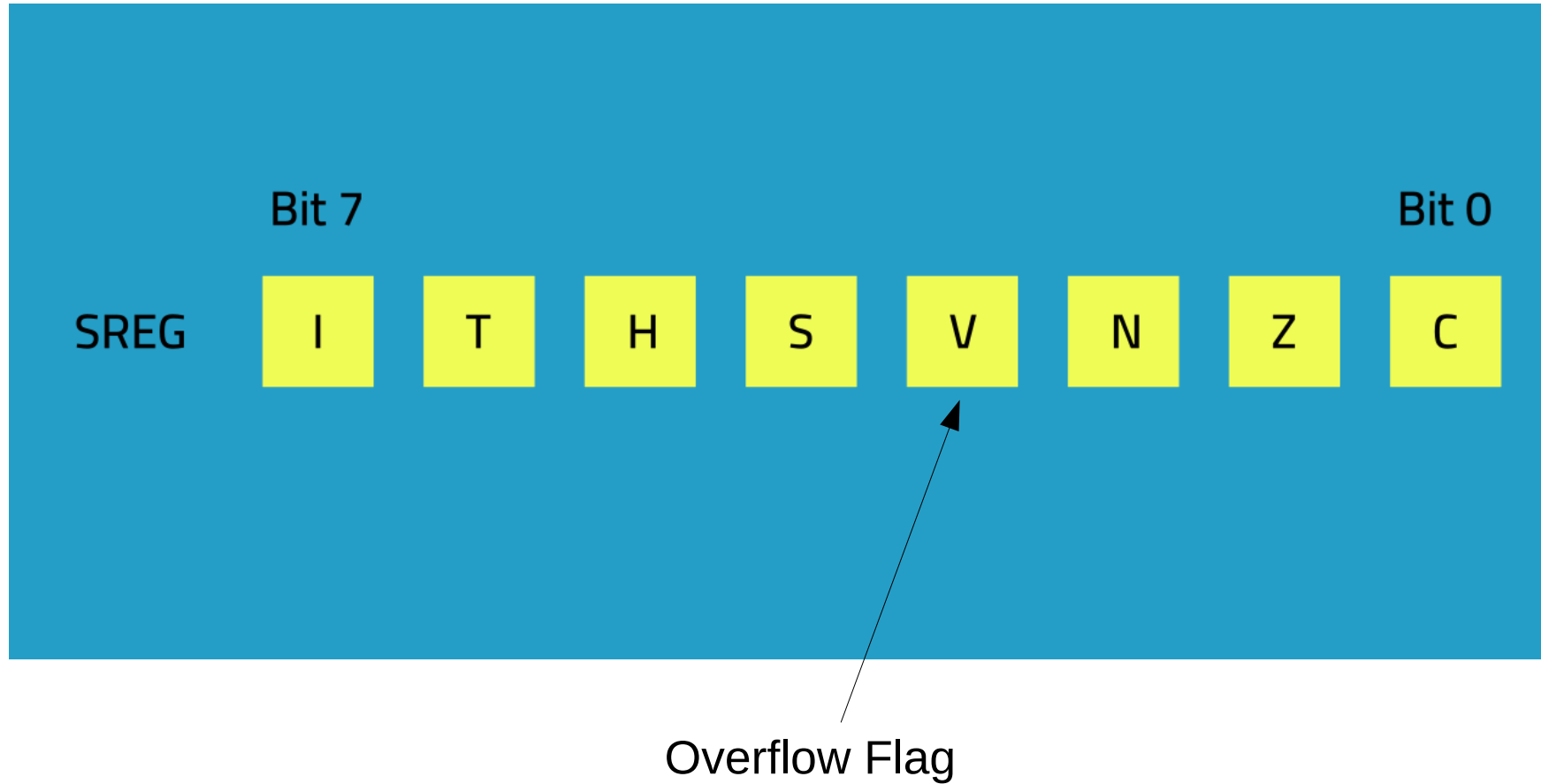
Zero Flag

# Status Register

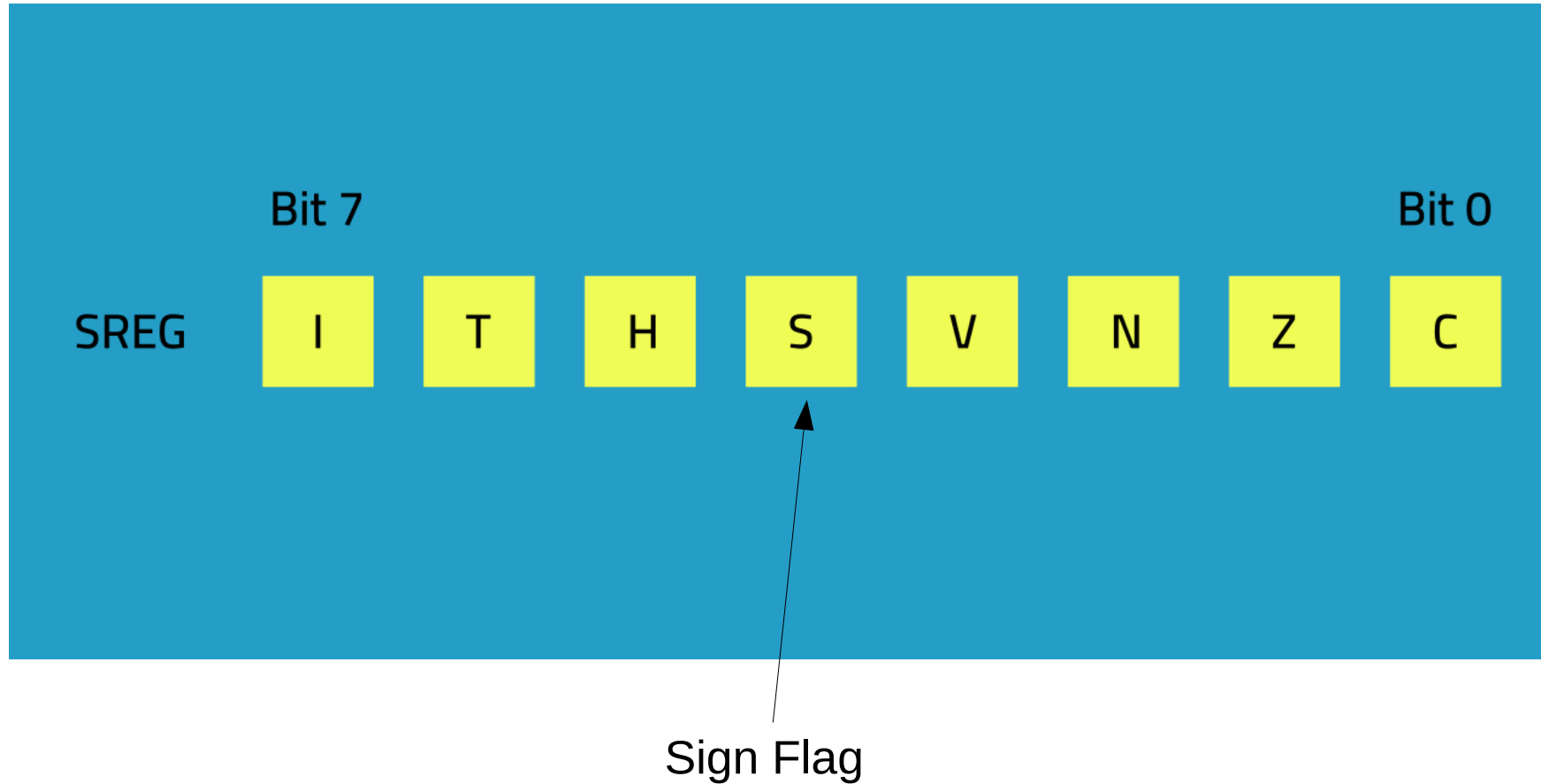


Negative Flag

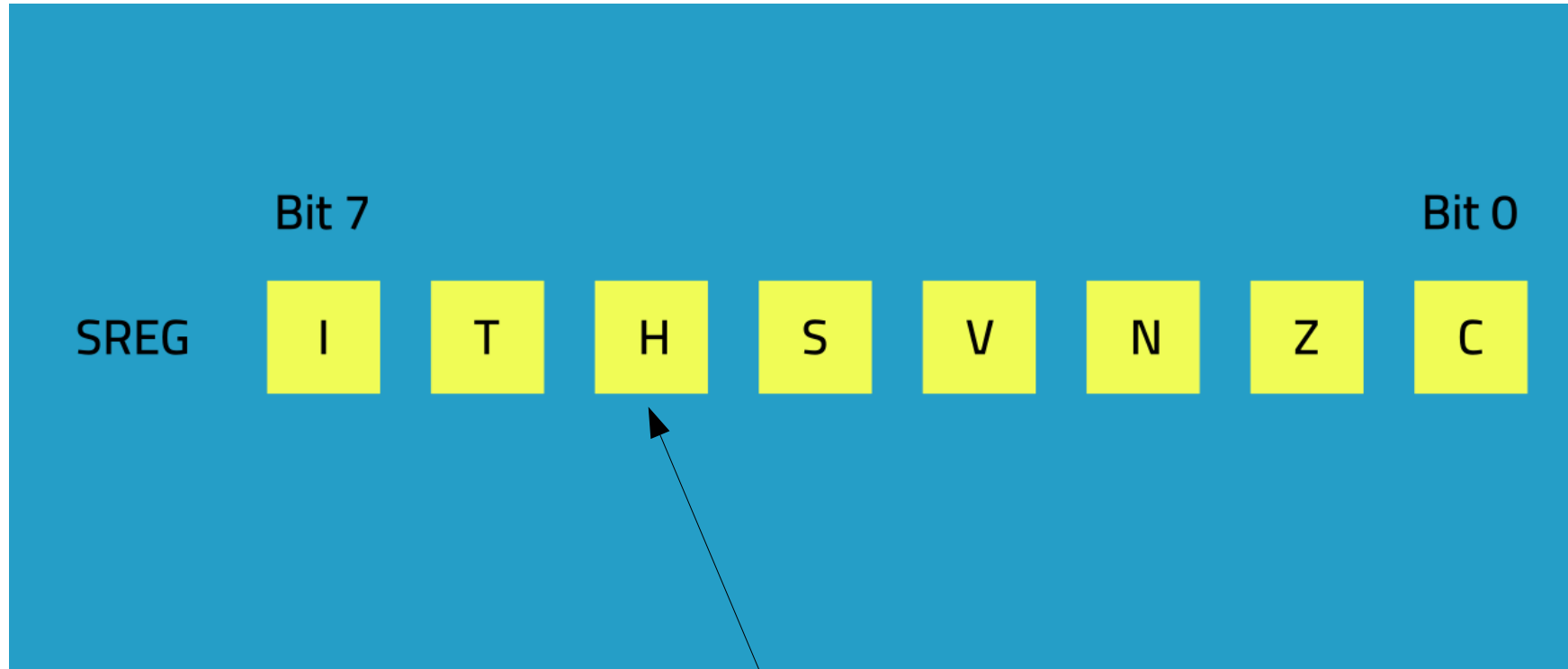
# Status Register



# Status Register

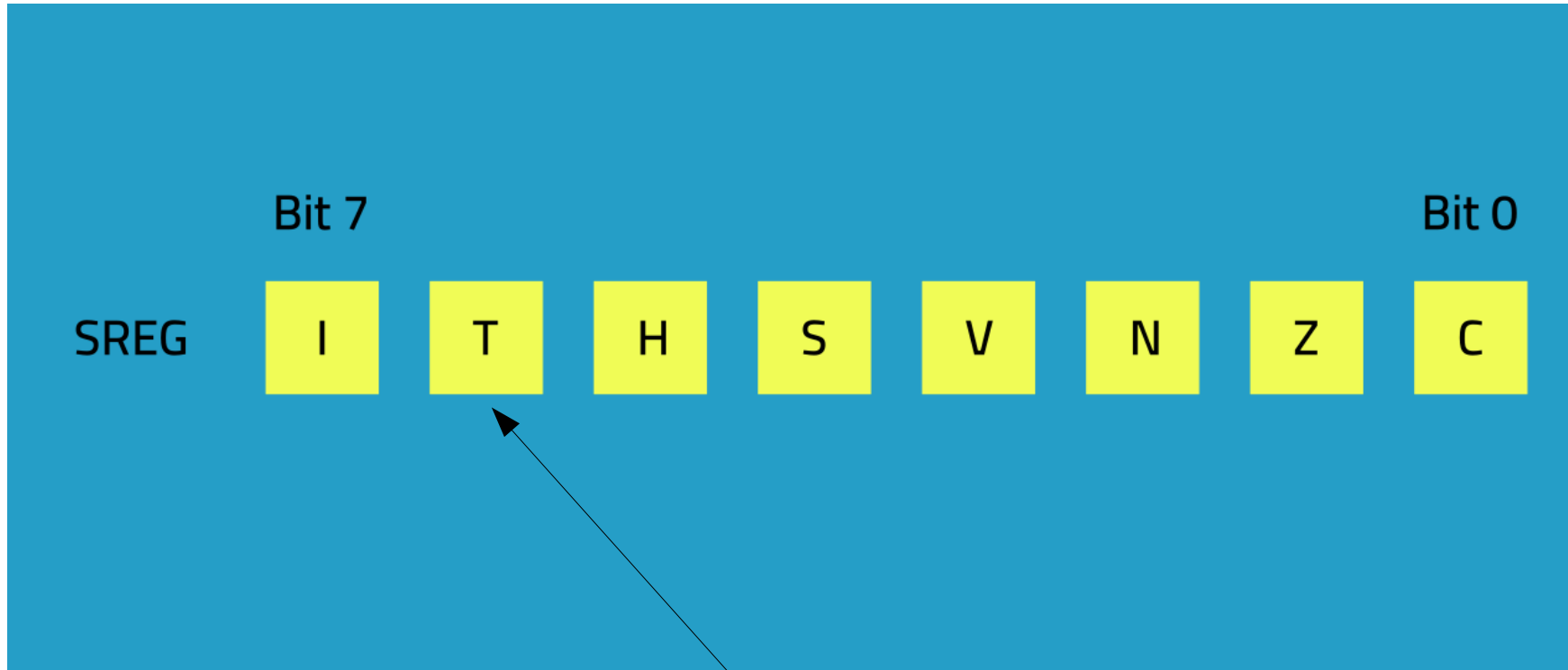


# Status Register



Half Carry Flag

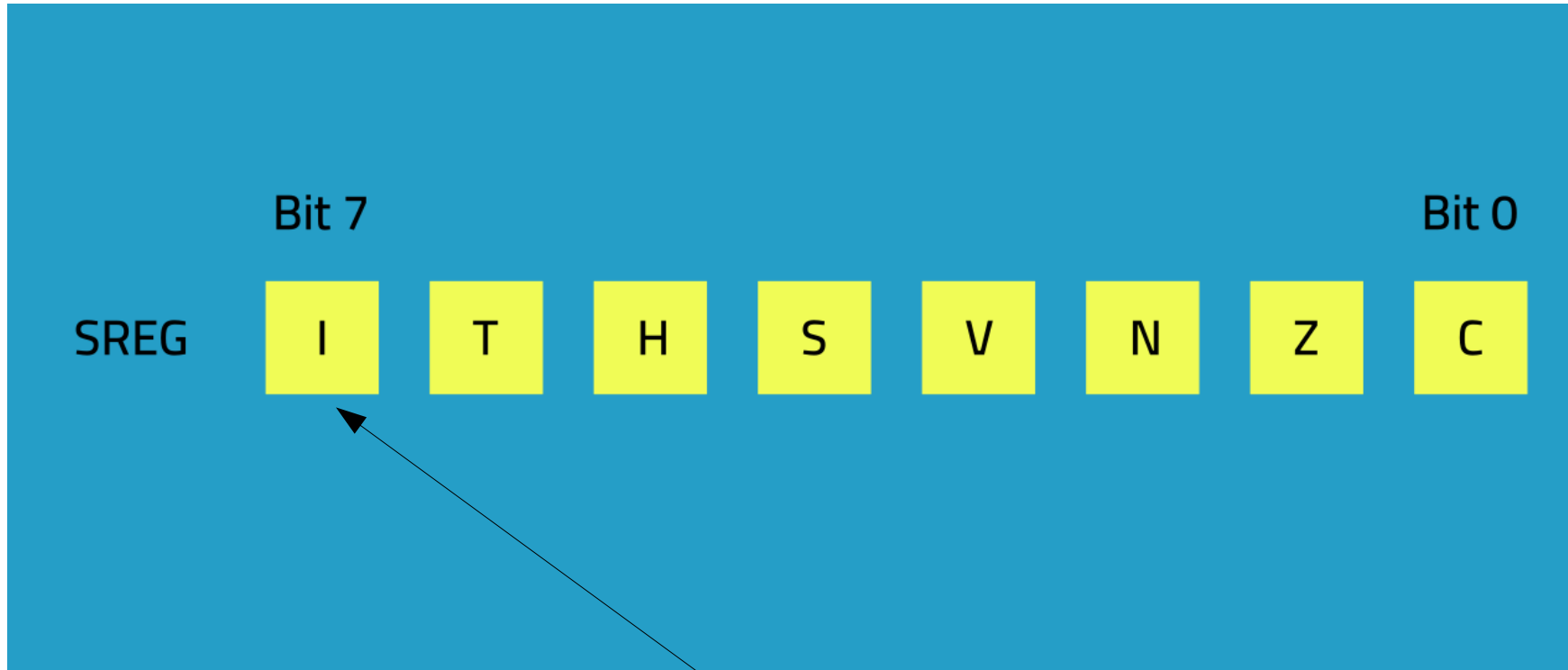
# Status Register



Bit Copy Storage



# Status Register



Global Interrupt Enable

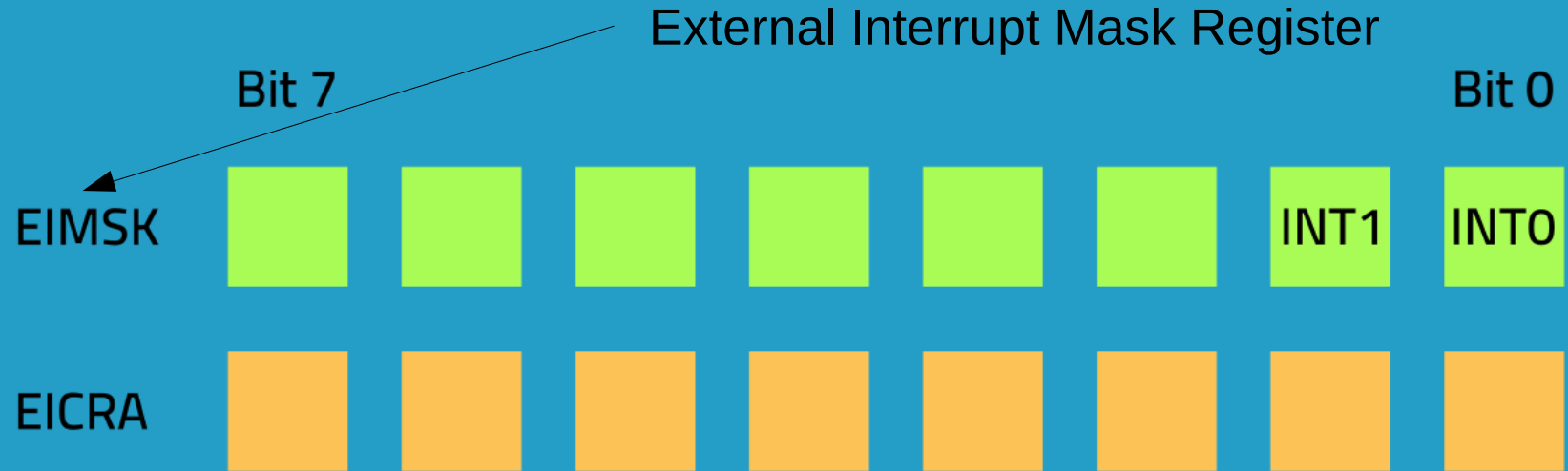
# External Interrupt Registers



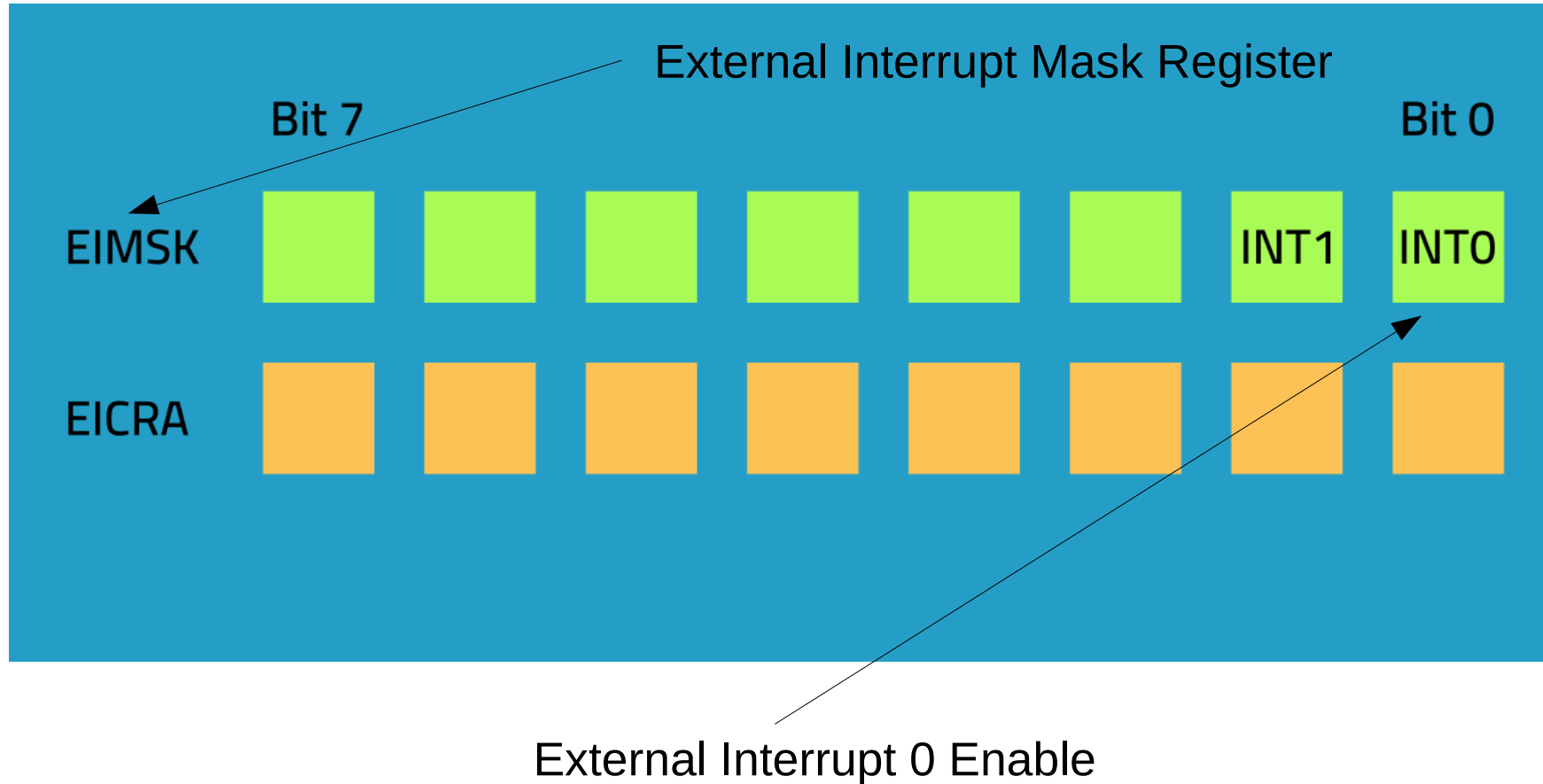
# External Interrupt Registers



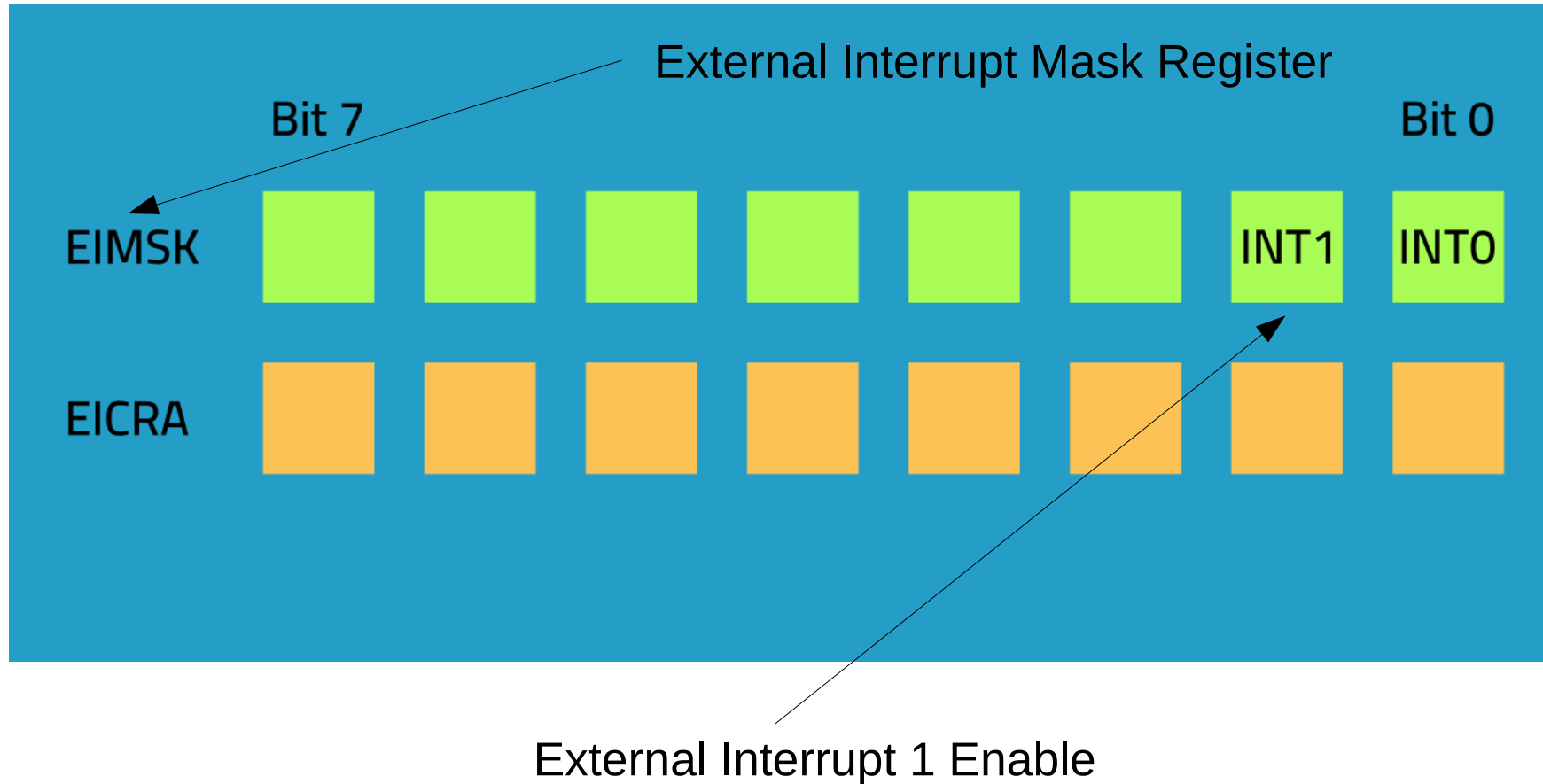
# External Interrupt Registers



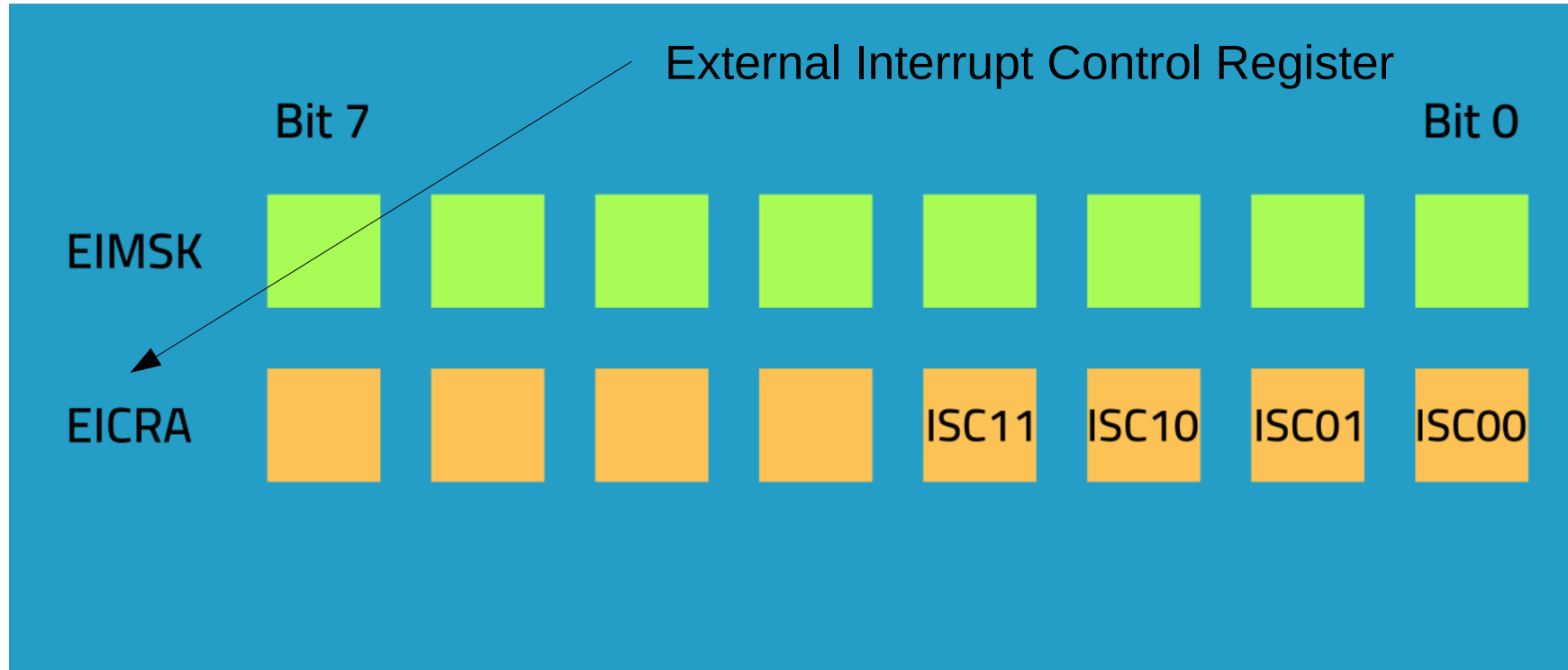
# External Interrupt Registers



# External Interrupt Registers



# External Interrupt Registers



# External Interrupt Registers

| ISCx1 | ISCx0 | Description                                             |
|-------|-------|---------------------------------------------------------|
| 0     | 0     | Low level of INTx generates an interrupt request        |
| 0     | 1     | Any logic change on INTx generates an interrupt request |
| 1     | 0     | The falling edge of INTx generates an interrupt request |
| 1     | 1     | The rising edge of INTx generates an interrupt request  |



# Lighting LED through External Interrupt

```
#include <avr/io.h>
#include <avr/interrupt.h>
#include <util/delay.h>

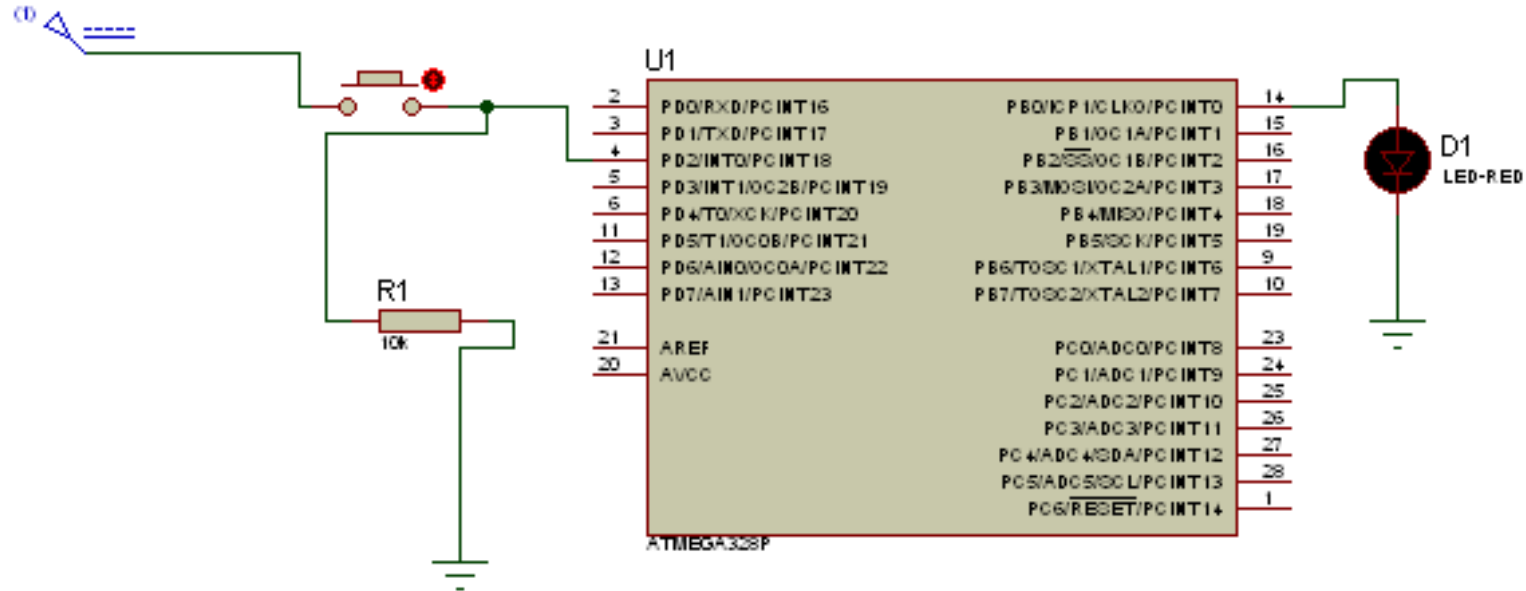
int main() {
 DDRB=0b00000001;
 PORTD=0b00000000;
 SREG=SREG|0b10000000;
 EIMSK |=0b00000001;
 EICRA |= 0b00000011;
 while (1) {

 PORTB=0b00000000;
 }
}
```

# Lighting LED through External Interrupt

```
ISR(INT0_vect) { //Interrupt Service Routine
 PORTB=0b00000001;
 _delay_ms(2000);
}
```

# Lighting LED through External Interrupt



Thanks